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PATENT SPECIFICATION  
SWISS CONFEDERATION  
FEDERAL OFFICE OF INTELLECTUAL PROPERTY  
PATENT NO. 449 571

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Conforms with disclosed statement No. 2071/65	

MAIN PATENT

USE OF THIOPHENOLCARBOXYLIC ACID AMIDES FOR THE TREATMENT OF  
TEXTILE MATERIALS

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Written documents and images	

compared during the course of the examination: Zeitschrift für Chemie, Vol. 3, No. 4, pp. 148-150, 1963

The present invention relates to the use, for the treatment of textile materials, of germicidal compounds of formula:



in which R is a phenylene or naphthylene radical that may or may not be substituted by one or two halogen atoms, and R' is a phenyl or naphthyl radical that may or may not be substituted by one, two or three halogen atoms.

It is known that the condensation products of phenylcarboxylic and thiophenylcarboxylic thio acids with aromatic amines possess properties which are characteristic of dyes.

It is also known that some 2-hydroxythiobenzanilides have fungicidal and bactericidal properties. For further details, reference is made to the article by G. Wagner and D. Singer "On the Preparation of 2-hydroxythiobenzanilidenes and 3-aryl-mono- and dithionbenzoxazinene-(1,3)" which was published in the journal Zeitschrift für Chemie, Vol. 3, No. 4, pp. 148-150, 1963.

The germicidal compounds used according to the invention have over these 2-hydroxythiobenzanilides, the advantage of being more active, where the activities are indicated by the inhibition zone in millimeters, as will be explained below. They can be prepared by the method according to Hopper, MacGregor and Wilson, which is indicated in the January 1941 issue of the Journal of the Society of Dyers and Colorists, p. 6. The following table indicates a certain number of compounds and it gives their germicidal efficacy against *S. aureus* in tests carried out on agar plates by indicating the inhibition zone in millimeters.

①	Composé N°	Formules	②	Zone d'inhibition mm	③
1				5,0 *	

\* [Commas in this table represent decimal points.]

1	Composé N°	Formules	2	Zones d'inhibition mm	3
2			5,0		
3			5,5		
4			5,0		
5			2,5		
6			2,0		

① Composé N°	Formules ②	Zone d'inhibition mm ③
7		2,0
8		4,5

Key: 1      Compound No.  
 2      Formulas  
 3      Inhibition zone, mm

A study of the table shows that the germicidal power of the compounds does not seem to be increased substantially by increasing the number of halogen atoms on the ring. This is apparent by comparing Compounds 1 and 2, for example. However, the germicidal properties are stronger with the phenyl radical than with the naphthyl radical, as one can see by comparing Compound No. 1 with Compound No. 7. Thus, it becomes apparent that the exceptional germicidal power of the compounds resides primarily, in an inherent fashion, in the structural arrangement of the molecule rather than in the halogenated substituents.

The tests were carried out in triplicate, as indicated below.

Bacteriological tests were carried out on *Staphylococcus aureus* with a 24-h-old culture at 37°C. Each one of the compounds of the table was incorporated into soap known by the registered trade name "Ivory (neutral toilet soap, white, of high quality, formed from a mixture of 80% sodium soap and 20% potassium soap, which was produced from a mixture of 70% tallow and 30% glycerides extracted from coconut oil, according to the U.S. Patent No. 2295594 filed January 28, 1941), at a concentration equal to 1 wt% for the soap and 0.1 wt% for the compound mentioned. Cotton disks having a 10-mm diameter were immersed in this mixture, thoroughly rinsed, dried and applied to agar inoculated in Petri dishes, and the inhibition zones were measured after 24 h; the mean values are indicated in the table.

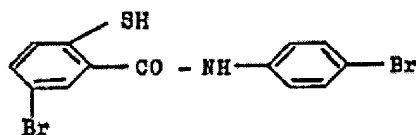
The germicidal compounds present can be deposited onto textile materials at a concentration as low as 10 ppm, although, from a practical point of view, it is desirable to use up to 50 ppm or 0.001 wt%, or 0.01 wt%, and up to 0.1 wt% or more. The term "germicidal

activity," comprises the action of inhibition and destruction of bacteria, fungi and other similar organisms.

The use of the present compounds makes the textile materials hygienic, for example, cotton gauze. For the treatment of these textile materials, any above-mentioned germicidal compound can be used to impregnate them, if it is mixed with a surfactant. The method can be as follows: the germicidal agent is pulverized in a grinder to very fine, flour-like particles, and the material is then suspended at a concentration of approximately 0.1% in water containing approximately 0.01% of a surfactant such as lauryl sodium sulfate or another similar detergent. One then passes the textile material through this suspension until it is impregnated with it; after that it is dried.

A detailed embodiment example of the use of the germicidal compounds in the treatment of textile materials is indicated below.

A suspension of 0.1% germicide is prepared by micronizing the following compound:



in an aqueous solution containing 0.01% lauryl sodium sulfate in a micronization grinder until the suspension has a milky appearance. Then, one sends the textile material from a roller through the suspension at a speed such that the material absorbs uniformly a concentration of 0.01% of the germicidal compound. The textile material is then dried in an oven. The aqueous suspension of germicide is continually replenished as it is consumed.

### Claim

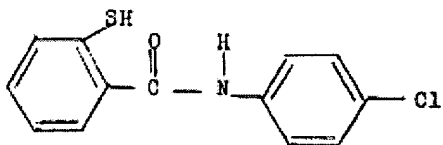
Use, for the treatment of textile materials, of germicidal compounds of formula:



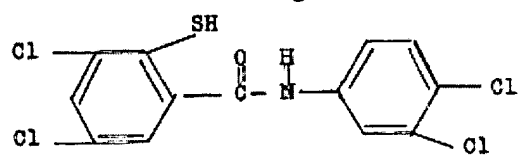
in which R is a phenylene or naphthylene radical that may or may not be substituted by one or two halogen atoms, and R' is a phenyl or naphthyl radical that may or may not be substituted by one, two or three halogen atoms.

### Subclaims:

1. Use according to the claim of the compound of formula:



2. Use according to the claim of the compound of formula:



3. Use according to the claim of the compound of formula:

